

SWIM Plan Comments for Consideration – Pensacola Bay Watershed - 2017

We are:

Collectively, wish to thank the NFWFMD for accepting these joint report comments and allowing our thoughts, observations and recommendations to be considered for inclusion in the final Pensacola Bay Watershed SWIM Plan.

Our organizations have been active within this community and watershed for decades, and serve the citizens of this area in a multitude of ways including education, outreach, sampling, field trips and presentations. Our intentions are to cross pollinate within our changing community and create better stewards of our beautiful natural resources. Our organizations complement each other without duplication, often without funding other than donations, and work in tandem to preserve our natural flora and fauna. We are engaged in these natural resource related discussions and dedicated to preserving our resources, culture and heritage.

We are the Membership and Boards of the:

- Francis M. Weston Audubon Society;
- Bream Fishermen Association;
- Longleaf Pine Chapter of the Native Plant Society; and
- Panhandle Watershed Alliance

Summary

The collective team of ‘Reviewers and Respondents’ have successfully identified issues and opportunities that we believe, if adopted, could significantly improve the planning process and maximize potential environmental benefits to all the local communities within this watershed. The Pensacola Bay (PBS) system watershed covers nearly 7,000 square miles in northwest Florida and southern Alabama. Approximately 32 percent of the watershed is within Florida, with the remainder within Alabama. In Florida, the PBS spans three counties, each with several smaller communities (some incorporated others not) which attempt to manage through a composite of the laws, regulations, and activities of numerous jurisdictions and public and private sector organizations.

This uncoordinated oversight is evidenced by many citizens in this watershed who often do not know which agency or department has authority over environmental problems. Continued impairments including spills, stormwater runoff, sedimentation and turbidity which can be visibly obvious, less obvious are septic leakage or the pumping of stormwater into small creeks and streams.

We recommend a new trajectory to address growth in the region without compromising the environment. We recommend setting up a ‘Fund’ which is insulated from city/county/state agencies to support the environmental monitoring currently being conducted by the many organizations listed as authors. We recommend more transparency and accountability as to

what activities are being considered which may change our current landscape due to growth without considering the natural resources.

Our organizations observe little cohesiveness and collaboration between inter-state agencies (FDOT, FDEP, WMD, Dept of Ag, and FL Forest Service); federal agencies (USEPA, USACOE, USFWS); and city, county level agencies. The BP oil spill fines and associated RESTORE Act Funds appear to be the only impetus for funding these SWIM Plan Updates, which we believe should be updated at least every 10 years. These SWIM Plan updates should provide some level of accountability of the projects implemented from the previous reports' recommendations: namely were the ideas and concepts implemented; did the project reach the goal intended; are their lessons to be learned which can be captured and shared; and information publically available about who designed, implemented, monitors the project(s) for future natural resource and surface water protection.

If these SWIM Plan Updates are not being implemented or used by agency resource managers, then funding these updates begs the question – Could this money be better spent elsewhere?

Considerations and Observations

The population of Florida exceeded 20 million people in 2015 and invited over 100 million visitors to enjoy our states sunshine, beaches and natural resources. In 1990, the population in Florida was just at 13 million and beach related tourism contributed \$15 billion a year to the state's economy (1996 FL Dept of Community Affairs, State of the Coast Report).

During that time frame, the NFWFMD published the PBS SWIM Plan and identified the following as intended to reflect the broader goals of the SWIM Program as a whole.

- I. Minimize undesirable impacts on the riverine and estuarine system from adjacent upland portions of the watershed.
- II. Attain and maintain water and sediment quality at levels that allow for the recovery and perpetuation of a healthy riverine and estuarine system.
- III. Achieve heightened public awareness and coordinated management of the Pensacola Bay system, including integration of existing resource protection and restoration programs for accomplishing the aforementioned goals.

While the goals identified above were very important then and remain so now, without proper dedicated funding, qualified staff and independent oversight – these goals will be impossible to reach. Consequently, water quality continues to be impaired, sedimentation rates have increased, and habitat loss continues at an alarming rate. What's more, this portion of the state is growing in population and the accompanying building and development needed to support that growth, but as growth increases so do the numerous impacts on the environment. Resource managers and funding in every governing agency have been cut; making our resources very vulnerable.

Public education and awareness is often accomplished through conservation organizations and citizen awareness, but a centralized 'go to' location for information - on water quality conditions, which fish are safe to eat, or is water from the tap safe to drink - remains incomplete and fragmented. The lengths to identifying and allocating funding for something as

fundamental as navigational maps (for all the tourists renting vessels in area waters) depicting the remaining seagrass beds in Santa Rosa Sound requires years of patience and herculean efforts in securing financial support. The same applies to efforts in the identification and eradication of invasive species (CISMA), development of informational signage or brochures, and supporting local citizen water quality monitoring.

Another observation which is disturbing is the lack of dedicated funding for maintaining previously funded projects. An example would be when bridges are replaced along waterways and within a year of implementation invasive species are identified at these sites. We believe monitoring and maintenance are as important after the project is completed as they are before the project has begun – to better understand how these changes impact the flora and fauna associated with these landscape changes.

Growth, Fragmentation and Impact on Connectivity of Waterways

Within this watershed, the FL Dept of Transportation projects appear to be having the most numerous observed negative impacts associated with them. Projects, large and small, ranging from interstate, highway and county/city roads expansions and repaving are often unaware of the sedimentation issues in our region, the spread of invasive species (particularly cogon grass), and the difficulties of working in low lying sandy landscapes that receive heavy downpours frequently. Considerations for the timeframes that dictate when projects are identified, how the public is informed of upcoming work and how to contact them when environmental concerns arise are purposefully designed to be difficult.

An example of this type of situation, which could have been handled much better and mitigated by open lines of communication follows: Shortly after FDOT cut down and cleared the live oaks at Scenic Hwy and I-10 for road expansion in January 2014, problems arose. (At the time of this writing, March 2017, this portion of the FDOT expansion is still incomplete.) While we have no doubt the FDOT received all the permits required to start work, our community was impacted and caught off guard by these actions. Some of the sentiments included the following:

We've lived in our home for over thirty years. We know all our neighbors. We are a community. We love our creek. And the wildlife corridor it provides. We used to be able to walk from our home to the GE swamp on Scenic Hwy. We have many visitors and residents in the riparian zone along the creek, which include:

- Grey Fox (<http://www.nhptv.org/natureworks/grayfox.htm>),
- Seminole Bats (http://www.floridabats.org/Species_LASE.htm),
- Great Horned Owl (http://en.wikipedia.org/wiki/Great_Horned_Owl),
- And the usual suspects (raccoons, possum, deer, beaver, etc).

Our neighborhood, our wildlife corridor community, and our creek are all being impacted by unbridled growth. We love our trees and the canopy shade they provide in the summer, the sounds of different winds blowing through them, the songs of birds that live on them.

Suddenly everything is different. Without any notice, any warning, and any preparation time, the FDOT cut down all the trees that provided a greenway and buffer from the interstate to our neighborhood. My neighbors and I stood and watched in disbelief as our

landscape was cut down. We spoke with a man who worked for the company, and he gleefully said 'by noon all them trees would be gone'. And he was right. Today, we have constant noise being thrown our way. Semi-trucks cause the loudest noise.

We learned that the FDOT has a remedy for the noise, it's a wall. A wall of concrete. Not a habitat, like our greenway which had trees taking in our carbon dioxide and exchanging it for oxygen, or tall, far reaching trees that slowed the winds during storms and provided a place for the bats who ate the bugs to roost.

The FDOT is going to build a wall of concrete. My neighbors and I don't really want a wall of concrete. We were never included in this decision. We liked our neighborhood the way it was. It was in a state of equilibrium. We've all gotten used to the sewage spills from the lift station on Grave Yard Creek (they happen every 6-8 months), and are used to seeing people buy land parcels and remove every tree just to park their boats, trailers, and stuff. Stuff that their sub-development and home owners associations (HOAs) won't allow. People don't really value my neighborhood, or the community that we make up.

Examples of FDOT interstate expansion projects include the addition of extra lanes, in which the new lanes will be replacing the center vegetated swale. The vegetated swale is performing an important stormwater function by holding and slowing the water from rain events until it can percolate into the ground. Stormwater ponds, while engineered to handle the additional rain from these impervious surfaces remain unsightly and could be planted with native species to support wildlife.

While new roads invite new growth, and growth is inevitable, we recommend a stronger application towards Smart Growth within all the communities located within this watershed. (<https://www.epa.gov/smartgrowth>)

Soils entering the nearby waterways create pulses of sedimentation from these projects, when rooted vegetation is removed and not replaced. What's more, best management practices (BMPs) are often an afterthought and considered added nuisance to track during the project. Unfortunately, evidence of this practice can be identified at virtually each project location.



Aerial view of I-10 and Scenic Highway in Escambia County, FL, adjacent to Pensacola Bay. Note the sedimentation in the bay and the large stormwater ponds roughly 4 acres in size each – the median is still visible in this view from Google Maps, February 2015.

Within this region, the interstate was developed in 1968-72. Many practical technologies have been developed and improved over the decades, but the crossing of wetlands, creeks, streams, and rivers continues to be done ‘the old fashioned way’ in NW FL. When bridges are used they often span the body of water but do not include the riparian zone. As a result, during heavy rains water can back up, constrict flow thus increased velocity at bridge crossings causes extreme erosion. The role of the riparian zone and flood plain connectivity is what protects the quality of water and intercepts nutrient run off. Biologically speaking, this is where primary productivity occurs. Spanning the riparian zone before crossing the river appears financially cost prohibitive, but consider the cost to water quality every time it rains. Our area receives 65” of rain annually.

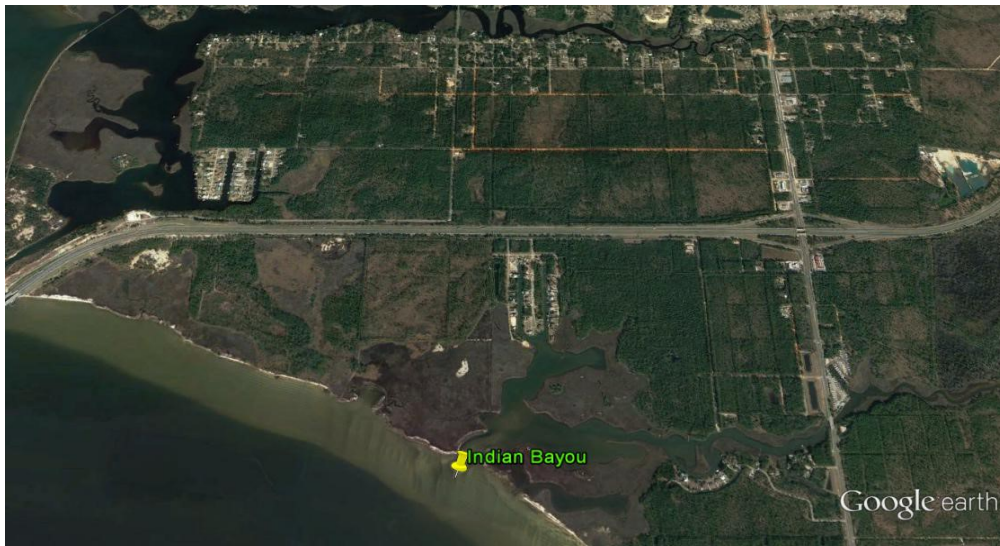
In this watershed, the intersection of roads and water conveyances (ditches, small branches, and ephemeral creeks) are connected by round culverts. Larger creeks by box culverts, sometimes arranged side by side. Inexperienced – well intentioned engineers lack experience in highly erodible sandy soils of the area and often result in serious erosion. The placement of culverts in flood prone areas creates a bottleneck of water flow which can scour an adjacent bank. Unfortunately, it happens every time it rains in this watershed.

This is currently being observed in several locations within Escambia County, but for these SWIM Comments we will focus on the I-10 & Hwy 29 exchange, in which the additional lanes (widening) on I-10 cross both the Marcus Creek headwaters (which flow toward Perdido Bay) and one of the three headwater tributaries of the Carpenter Creek system (which flow into PBS).

An extension of the box culvert will convey water from the north side of I-10 to the south side. The impact to the creeks is several hundred feet of darkness, disconnection from the groundwater, and no biological activity. This type of impacts work against the goal of minimizing undesirable impacts on the riverine and estuarine system from adjacent upland portions of the watershed. Disheartening and frustrating is the lack of understanding (education) of how these complex systems (watersheds) work, survive and continue to adjust to more impervious surfaces (development) and fragmentation (roads) within the landscape. Equally frustrating is having the understanding that for bays and estuaries to be healthy and support seagrass, fisheries and recreation, the waters flowing into these systems must be healthy (not containing stormwater runoff, contaminated sediments or septic overflows) and contain important habitats (woody material).

In Santa Rosa County, Indian Bayou was fragmented in the 1970s when the I-10 was developed. Ironically, this system had several decades to self heal, another characteristic which can be accomplished by the environment when not disturbed.

In this case, and long before we knew what we know now, the interstate was built and the county, encouraging development sold low lying wetlands to a developer who platted out major roads and lots. Little if any development occurs directly in the upper portion of this wetland portion of the watershed, but the county dutifully brings in clay and grades the 1 mile lone road at their expense as needed. Prior to the interstate road expansion, emergent grasses grew up in the ditches thus creating a natural filter, in connecting the northern portion and the southern portion of the watershed.



Aerial view of Indian Bayou and I-10 system; Note the larger Mulatto Bayou in the upper left corner of the photo. Monterey Shores Subdivision is located on two canals developed in the late 1970s and early 1980s. The area due north of the interstate is platted and has many unpaved roads which are maintained by Santa Rosa. The unpaved roads are maintained by bringing in red clay and grading it to a flat surface.

In April 2016, the community of Monterey Shores Subdivision began noticing that each rain event left their bayou red with turbidity. The impacts were traced back to the recent I-10 expansion, in which mountains of red clay were replacing the grassed swale in the median. The homeowners contacted their county, their local county commissioner, who had just left the

position to run for another political office, the FDEP, the ACOE, the USEPA, and the news media. Every agency contacted collected information, but never acted on the issues or causes. The news media brought local attention, which caught WMD attention, but has not resolved the problem (at this writing). Finally, citizen groups were alerted and began investigating the issues.



1955 Aerial map of Indian Bayou (lower right side of photo) and Mulatto Bayou visible in upper left corner near the numbers 55. Interstate 10 was developed during 1972-1976 in this part of the county and unfortunately fragmented portions of each watershed during the construction phase. The feeder creek from the northern portion of the system is clearly visible in photo.

Watershed delineations applied to the system indicated the upper and lower portions of the watershed are fragmented by the interstate and only connected through culvert systems. Another interesting component of this situation is that these low lying areas are tidally influenced. This was determined by observing red clay in the ditches in the northern portion of the system, followed by a delay until an outgoing tide carried the turbid waters into the bayou.



This USGS National Hydrography Dataset (NHD) shows flow lines across I-10 (dark blue) entering the feeder creek to the east of the subdivision.

Equally disturbing was the lack of communication and oversight this project revealed. More BMPs and additional testing was convened, but these efforts are as intermittent as the rain events that drive the problem.

Mitigation credits were purchased to offset this impact by paying for freshwater, wet prairie flatwoods totaling 3.2 credits in a private mitigation bank and 3.2 credits in a state mitigation bank. Unfortunately, while those efforts may suffice somewhere else, this bayou is being impacted by each rain event and the cause is not being addressed.

Monies to purchase the northern portion of this watershed and return it to a wetland system remain unavailable at this time. One benefit in this scenario is that no homes have been built along the 1-mile long red clay road which parallels the interstate, thus making it cheaper to purchase this property.

The Santa Rosa County tax appraisal website identifies many of the owners of these properties as living elsewhere (non FL residents) and several properties are for sale, in some cases have been for several decades.



Residents living along Monterey Shores view turbidity in their bayou every time it rains. February 2017

The Permit Application for this I-10 Expansion Project was applied for by a firm in Colorado, for \$400. The application was properly filled out and permit was issued. The NFWMD issued the permit and in doing so was aware that the discharge from this road activity and future stormwater runoff will discharge directly into Indian Bayou (as seen below).

It is unclear as to why the FL Department of Environmental Protection and Water Management Districts weren't consulted about discharging into FL Waters, but funding cuts and transfers of permitting responsibilities in all state environmentally related programs have been reduced in funding, personnel and apparently stewardship of the resources within the region.

The preparation activities for road expansion included clearing out emergent vegetation from box culverts and adjacent ditches. As a result, every rain event washes red clay into ditches which are hydrologically connected and tidally influenced.

This watershed and its associated bayous were investigated as part of a grant from the Gulf Environment Benefit Fund in 2016, to identify all submerged aquatic vegetation within the area and collect data and information as to what are the 'Roadblocks to Recovery' within these systems.

This bayou was investigated and found to have the submerged aquatic vegetation, *Ruppia*, which is an important part of a healthy system. *Ruppia*, as with other sea grasses, provide important habitat and act as nursery grounds for many fish and invertebrate species. Projects with unintended impacts such as these do not attain water and sediment quality at levels that allow for the recovery and perpetuation of a healthy riverine and estuarine system.

http://ca.dep.state.fl.us/mapdirect/?focus=contamlocator The ICR may be accessed at: http://www.dep.state.fl.us/waste/categories/brownfields/pages/ICR.htm , or http://ca.dep.state.fl.us/mapdirect/?focus=icr
<input type="checkbox"/> YES Continue to VLC, below. <input type="checkbox"/> NO Continue to Part VII.
C. Has the site been remediated? <input type="checkbox"/> YES Continue to Part VII. <input type="checkbox"/> NO Continue to VLD, below.
D. Are the pollutants of concern (i.e. contamination) present in ground water at the dewatering project site at concentrations equal to or exceeding the surface water criteria in Rule 62-302.530? <input type="checkbox"/> YES Dewatering activities <u>do not</u> qualify for coverage under this generic permit. However, the site may qualify for coverage under Rule 62-621.300(1), F.A.C., or under an individual wastewater permit on the appropriate form listed in Rule 62-620.910, F.A.C. <input type="checkbox"/> NO Continue to Part VII.

VII. DISCHARGE INFORMATION:

A. MS4 Operator Name (if applicable):	
B. Receiving Water Name:	DIRECT RUNOFF TO BAY; INDIAN BAYOU

VIII. CERTIFICATION:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

The permit above for this project was issued by the same agency, although a different department, that is currently responsible for updating the Surface Water Implementation and Management (SWIM) Program.

A creative, win-win solution has been identified (placing this land into conservation and restoring it) which would protect the bayou and keep development out of low lying areas. In addition, it would shine a light on the county for valuing the natural resources and understanding how the watersheds function. However, to achieve this, multi-jurisdictional entities would need to come to the table and work together on a new and different approach. At the time of this writing, that opportunity has not occurred yet.

Citizen Scientists Supporting Land Management Initiatives

Parts of the PBS Watershed are located in the Blackwater River State Forest (in FL) and the Conecuh National Forest (in AL), and adjacent to Eglin Air Force Base. While water quality of the Blackwater River is generally good (several WBIDs are listed for fecal coliform), sedimentation due to sand, clay and gravel mining have increased sedimentation rates in these systems. Portions of the mainstem of the Blackwater River near the Hutton Unit have blown out during past heavy rain events causing the river to flow through the riparian zone to re-establish its connectivity. Recommend curtailing mining operations which are close to surface waters which have could cause blow-outs during heavy rain events.

After Hurricanes Ivan and Dennis moved through the region, Audubon volunteers received permission from FL Forest Service and the Fish & Wildlife Commission to conduct a bird survey in the Blackwater River State Forest. The Francis M. Weston Audubon Society was surprised that no year round survey had been done in the forest since the new management efforts to restore the longleaf pine forest had begun approximately 20 years ago. The team divided the forest into 13 areas of equal size. The groups identified and monitored each area in the Blackwater River State Forest and collected data 4 times a year for 3.5 years. Locations included several habitat types, some of which had been managed by fire and others not. The findings by the birders were interesting with the discovery of 181 species which use the forest either year round or come to nest there or as visiting migrants passing through the area. Hopefully this survey will act as a marker as this young Longleaf Pine/Wiregrass habitat matures. Ironically, funds to prepare the report and publish these findings for distribution were never available.

As a result of these working relationships between grass roots organizations and various agencies, in 2015 these same citizen groups were invited to participate in a multi-day 10 year management plans for the forest. Each organization represented different user groups and focused on recreational and wildlife opportunities related to their groups.

GRASI

Shortly after the Blackwater River State Forest 10 Year Management Plan meetings convened, several citizen groups, including those presenting comments here, discovered that the military would be using the forest for training purposes. What began as the Gulf Regional Air Space Initiative (GRASI) morphed into a landscape component and included activities in wetlands and creeks, steephead ravines and seepage slopes, pictures within the project description circulated included Hummers traversing creeks and wetland systems. A very large outcry and push back resulted in several amendments to the plan. Still unknown today is if portions of the plan were implemented or if this effort was abandoned. This event has driven another wedge between the trust of citizen stakeholders and state agencies. What's more, these scenarios reveal a lack of coordination and planning amongst the state agencies and the federal agencies.

Funding Support for Citizen Science Groups

Since the 1990 and 1997 PBS SWIM Plans were published have conditions improved or become more impaired? In 1973, Tom Hopkins, head of the then new UWF Marine Sciences Department observed the following when discussing the Pensacola Bay System, *"The management of the surrounding uplands is fragmented amongst a multitude of federal, state, and regional regulatory agencies, as well as numerous local governments bordering the system. Present day management is accomplished through uncoordinated implementation of various monitoring, permitting, and regulatory programs. In addition, many of these programs are reactive rather than proactive in nature, a critical situation given the growth pressure that this region has experienced and will experience in the future."*

Citizen water quality monitoring programs have been active in this watershed for the past 50 years, providing a large and valuable data set of conditions over time. What have these organizations observed over their 50 years of sampling? Pristine creeks have become impaired or disappeared by being buried under parking lots or tons of sediment.

Jurisdictional agencies have relaxed regulations to accommodate growth, sometimes relying on outdated and limited information. Compliance assistance has replaced compliance enforcement and limited funding has cut staff positions. We believe strengthening environmental ordinances while thoughtfully managing growth would help avoid further deterioration, increase property values and rekindle stewardship. Independent oversight would serve to reestablish trust between citizens and the bureaucratic mentality that has evolved in our communities.

Increasing water quality standards and improving natural habitat in low lying areas could serve to mitigate flood events by providing the opportunity for wetlands to hold and slow waters. Wetlands, both isolated and connected to riparian zones are priceless for maintaining our water quality along these watersheds. In addition, these areas would provide wildlife corridors for our native and migrating species and serve as refuge and rest areas for many of the fauna which fly across the Gulf of Mexico.

Funding cuts during the recent and current political climate have decreased the level of regular monitoring of stream and river biota; such that the State of Florida has written the current permits to include self-monitoring and self-policing by municipal, industrial and the land development industry. Self-policing has not improved the water quality in this watershed.

The shift from agriculture or natural lands to accommodate growth is a direct impact to loss of habitat. As rural areas become urban, the patches of green space that remain are often stripped of all weeds and their flowers, which bees rely on for food. We believe well managed buffers and maintaining low lying areas for wildlife is imperative.

We advocate for citizen organizations to be funded so they may be properly trained to conduct monitoring and provide oversight and assistance to the many underfunded agencies that are currently relying on self-policing from their 'Permittees'. Training would make data available for various agencies relying on quality data.

A sum equivalent to the tax incentives offered to lure development to the region should be set aside for water quality monitoring and follow up compliance monitoring by independent organizations.

To develop relationships between citizens and governmental agencies, trust is imperative. The observations and actions within this community continue to be disconnected. Perhaps this has to do with funding cuts and staff reductions. An observation worth monitoring is the loss of continuity when staff turnover occurs in various departments and agencies. The relationships and institutional knowledge of these collective organizations within the NW FL Region are long lasting and should be valued as a resource.

Developing this trust is a process. Unfortunately, a policy specialist recently pointed out that at a higher level, federal agencies do not trust their state/county/city counterparts; and in return none of these agencies trust the public. Perhaps the biggest irony is that taxes support these bureaucracies and this way of thinking.

Erosion & Sedimentation

Unfortunately, the issues and sources of those problems identified in the earlier Pensacola Bay SWIM Plan continue to degrade the system.

Escambia Bay is the most highly stressed bay of the system. It receives the most significant permitted industrial discharges as well as pollutant load from the Escambia-Conecuh River System. Circulation is extremely limited, especially in the upper bays, and a large portion of pollutants adhere to suspended sediments and are deposited on the bottom. Escambia Bay sediments have the highest total organic carbon, TN and TP levels, as well as the greatest potential for toxic compound accumulations. Suspension of these sediments is, therefore, a serious concern. The upper portion of Escambia Bay has been described as being in a state of eutrophication. (U.S. Department of the Interior, 1970).

While steps have been taken to improve some aspects of the water quality in the system since the 1960s, the level of degradation remains high, and the system continues to exhibit signs of deterioration. – from the 1997 PBS SWIM Plan

New development is replacing natural lands at an alarming rate in this watershed. Frequently, minimal buffers are placed between these new developments and low lying riparian or wetland systems. We recommend increasing these buffers to a minimum of 50' and recommend 100' to protect water quality for stormwater runoff and sedimentation.



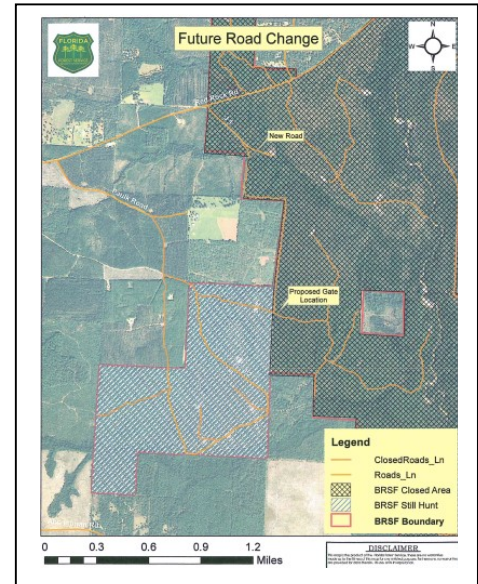
Student and young professional housing is occurring in the vicinity of the university. This property was cleared of every form of vegetation in late 2016, and these pictures reflect conditions in February 2017. Note the hose leaving the unfinished stormwater pond discharging into the woods above the creek.



The work crew was pumping sediment into the riparian zone adjacent to a small creek, Dogwood Creek, which empties into the Escambia River near the University of West Florida property. Note the hose lying over the downed tree.

While development continues at a rapid rate, another issue bubbling to the surface is newly created unpaved roads. Roads are often cut thru low lying areas and become a problem during rain events. In the case below, an expedited attempt to cut a road through the flood plain to connect to an otherwise inaccessible 500 acres during hunting season might have been too much of a temptation to wait for the proper permits to be granted. But as we observed in the previous examples, even going through the permitting process doesn't necessarily protect the watershed; it just allows the work to proceed for the price of a permit.

Unfortunately, the cost associated with repairing this impact will be expensive – and as a common theme in these issues - there are never enough monies available to repair the environment. These issues can be mitigated much more cost effectively now than remediation after the damage has already been done.



Washouts like these are very common in the region and have been addressed and mitigated by the FL Forest Service for many years. The issue for this 'permitted or unpermitted road' is that during a sizable rain event, water will wash down the cleared red clay road in the background and carry with it sediments and clay to suffocate the low lying area. The highly erodible soils in the landscape do not make management of these areas easy, which is why we suggest spanning these low lying areas if roads must be built.

In April 2014, parts of the PBS watershed received 28" of rain in 24 hours. Weather authorities called it a 500 year rain event. In February 2012, parts of the PBS watershed received 14" of rain in 24 hours. A similar event happened in 2009. The point is, our watershed receives sizable bursts of rain every few years and although we know this phenomenon occurs, we still issue permits to build in coastal and low lying areas. Our topographic relief is gentle, and our landscape is held together by the many roots of vegetation that have evolved to grow in these areas.

As growth continues to be the driver of development in the region, the newly proposed 'Bluffs Industrial Park' in the vicinity of the University of West Florida will likely have additional impacts on the watershed. <http://www.northescambia.com/wp-content/uploads/2015/11/bluffsmaster.jpg>



Aerial rendering of the new commerce park which will be located along the Escambia River.

Impacts to the area adjacent to the river are probable and may just be a matter of time. In the case below, the small creek which drains parts of Ferry Pass was likely stable until a new strip mall was built adjacent to it on university property. The removal of a beech forest began to destabilize the ravine along this creek; this was followed by more land clearing then the addition of a stabilizing retaining wall. The 28" rain event in April 2014 caused water from these activities to back up and blow out culverts resulting in the mess seen below.

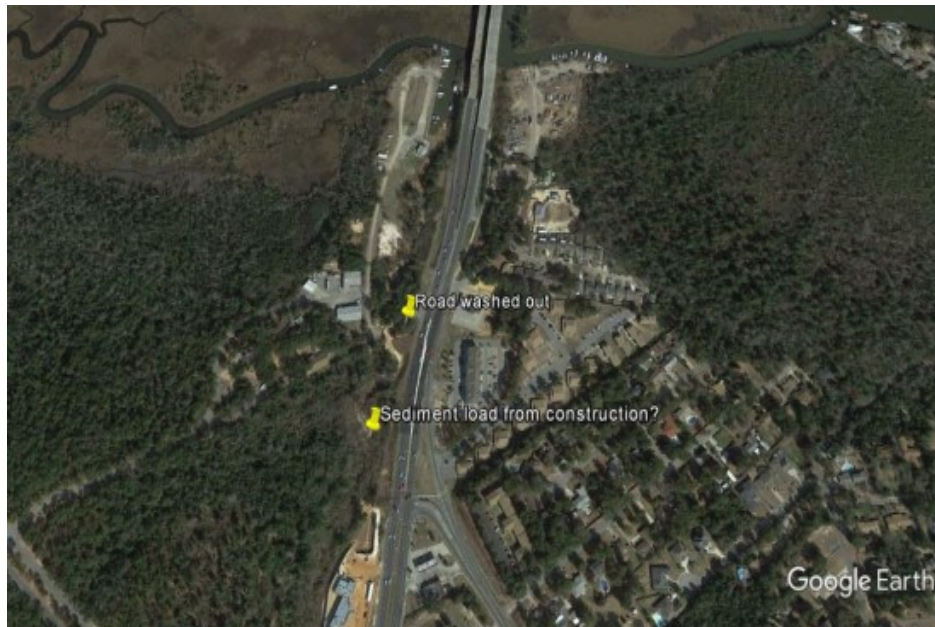


Small creek draining Ferry Pass area which was blown out after the 2014 rain event.

A small marina is located at the mouth of this creek and just west of the Hwy 90 Bridge which crosses the Escambia River. The volume of water coming off the roads and flowing into this system caused destabilization and allowed the sediment to become fluidized and behave like water.



Aerial view in 2013 of the Ferry Pass Creek which is adjacent to the N/S roadway



Aerial view in 2015 of the same image, post April 2014 rain event.

Events like these continue to deliver clay and sediment into our riverine systems during each rain event; which in turn are carried into our lower bays and estuaries. Clay can remain in suspension for days, sometimes weeks, depending on currents and winds.



View of the small marina at the foot of the Hwy 90 Bridge January 2017. The pilings in the sediment (forefront right) and the docks in the sand (forefront left) are all that remains from 12 slips which are now buried under sediment. Several large boats were buried during this event, including one in front of the boat in the foreground.



View of the 'stabilized' buried creek feeding into Ferry Creek Marina. Note the rip rap lining the creek bank. No native plantings for habitat were included for this stabilization project.

Micro-pollutants & Endocrine Disruptors in the Environment

As northwest Florida continues to grow and transition, it is imperative that our region has a solid plan in place. At this rate of growth, without adequate oversight by many eyes, the trajectory of this landscape will not be in harmony with the ecosystem and the benefits that a healthy ecosystem can provide.

Population increases will require additional treatment for wastewater facilities to address the many micro pollutants, microplastics and endocrine disruptors which are being detected in greater frequency and concentrations in surface waters. These compounds including micro pollutants are being detected by robust analytical methods related to the steady rise in the use of man-made substances. The compounds in question include pesticides, pharmaceuticals, biocides, ingredients in personal care products, waterproofing agents, detergents, paints, etc., which find their way into natural waters from a variety of sources – agriculture, households, construction and transportation.

The proliferation of chemical applications (pharmaceuticals) and the ageing population will guarantee the consumption of these compounds will continue to rise. What remain unclear are the behaviors of these compounds as they enter surface waters. The surface water chemistry of many NW FL watersheds is unique. Whether compounds have additive, neutralizing or synergistic, and the bioavailability to aquatic species (specifically invertebrates) will depend on its physiochemical properties. In many cases the desired effect when they were originally applied may exert an undesirable effect on a totally different organism. For instance, pesticides used to control weeds inhibit photosynthesis in algae, neurotoxic insecticides damage the nervous system of aquatic organisms, and endocrine disruptors from contraceptives or plastics impair the reproduction in fish. Some forms of damage may be more subtle and affect an organism's behavior or their immune system. Other complications may produce additive effects and toxicity through stressors such as increased temperatures or ultraviolet radiation.
(www.oekotoxzentrum.ch)

Unintended impacts from pesticide use such as are currently playing out with neonicotinoids and have been linked to colony collapse disorder within pollinators. Forty-two percent of the bee colonies collapsed in the United States alone in 2015. Agriculture makes up a large portion in this watershed. Impacts to food supply and risks are concerns to be noted and considered.

To that end, the waste water treatment plants with direct discharge into the PBS include the Pace Water in upper Escambia Bay; City of Gulf Breeze, Holly Navarre into Hidden Creek*, Navarre Beach and Pensacola Beach currently discharging into the Santa Rosa Sound. Holly Navarre currently discharges into Hidden Creek which discharges into the East River Bayou which enters East Bay. This facility has been out of compliance for almost a decade and cannot meet state water quality criteria. Instead of addressing the problem and installing upgrades, this facility has been granted a permit to move effluent to a larger body of water, namely Williams Creek, which discharges into Santa Rosa Sound.

To clarify, water quality criteria could not be met for effluent discharging from this WWTP into one waterbody, so the solution is to redirect effluent to a larger waterbody. Sounds like the old adage; the solution for pollution is dilution.

A Rapid Infiltration Basin System (RIBS) is being designed to address this concern. The RIBS approach will require an engineered and hardened system installed to hold water and slowly release effluent over time. The WWTP will not be undergoing upgrades to address the pharmaceutical or other endocrine disrupting chemical compounds entering the system. Consequently, this system will be discharging into one of the largest creek systems remaining on the built out Gulf Breeze peninsula, which is home to prized seagrass beds. We are not addressing the problem, instead we are finding “work-arounds” that are not sustainable over time.

A better solution would be to combine all four effluent handling systems, pool the knowledge and the wealth and develop a state of the art facility to accommodate pharmaceuticals and encourage reuse on the main peninsula versus Pensacola Beach. While politics will play a big role in this since the business of waste treatment is a multimillion dollar industry, this would protect the surface waters from additional impacts.

The Pensacola Beach WWTP operated by ECUA recently received another five year permit renewal for discharge. Several concerns about this aging facility and the risks associated with it should be noted. The 50 year old facility is built on a barrier island adjacent to Santa Rosa Sound. That statement alone is worth a risk assessment since we have firsthand knowledge of the vulnerability of these antiquated facilities in low lying areas. Annually, during peak summer events (air shows, concerts, etc) spill occur. When spills occur, they flow directly into the sound, in close proximity to a public beach which is well suited for children because of its protected quiet waters. This facility discharges into an estuarine body of water. The NPDES regulations state that toxicity tests should be run with bioassay organisms that would be expected to live in the same water body as the discharge area. This facility has been and continues to use freshwater organisms for their testing program.

The WMD recently issued a permit for ECUA to re-use treated effluent irrigation on Pensacola Beach. While re-use is a popular idea, we would caution about re-using nutrient rich water on a barrier island which is made up of sand and could encourage algal blooms as it enters in adjacent surface waters.

We would also caution about altering the landscape, bringing in non-native species, to accommodate this new source of water re-use. This situation was experienced in 2015, when developers active with island real estate updated the landscape on the barrier island by replacing native Sable palms with Pindo palms (native to South America). Non-native and ornamental invasive species (lionfish) are detrimental to the native ecosystem. The collateral damage, which is often overlooked, occurs when migrating birds and insects reach the island and miss out on food and shelter, habitat. The flora and fauna of these ecosystems are constantly in flux due to anthropogenic activities. Beach renourishment activities can impact turtle and shorebird nesting.



Recently planted Pindo palms line the ~5 miles (north and south side) of the main road on Pensacola Beach. Palms are planted ~20 feet apart.

Habitat quality and quantity are vital to this ecosystem. The loss of habitat, on which many species depend for sustenance, that which blooms in time with rain events, become critical for many species and their survival. As mentioned earlier with the water reuse discussion, endocrine disruptors – which are currently not treated for pharmaceuticals, personal care products, can impact sensitive species vital to the food web, namely insects that feed on vegetation. In Northwest Florida WWTPs can impact many species, in both the aquatic and terrestrial environment. As rural areas become urban, the patches of green space that remain are often stripped of all weeds and their flowers, which the bees rely on for food.



More disturbing than the addition of the landscaped planting was the total disregard for the native palms. Seen here, discarded sable palms lie on a vacant lot until they can be taken to the landfill.



This type of waste is irresponsible and should not receive any public form of funding over natural resource management funding.

We would like to recommend the use of native species in all landscaping, to assist all wildlife in the region. We would also support funding organizations that are focusing efforts on land management and invasive species eradication, including groups like the Six Rivers Chapter of CISMA (Cooperative Invasive Species Management Areas). Funding is always an issue, but we would include expanding the focus to work within communities and small parcel land owners as well as public right of ways. <http://www.floridainvasives.org/cismas.html>

The Navarre Pass Project

The Navarre Pass is a natural phenomenon which occurs during tropical weather events in which the barrier island breeches in the area east of Navarre Beach on Santa Rosa Island. Similar breeches occur in the Ft. Pickens portion of the island to the west. These natural passes quickly fill themselves in through sediment transport, thus also allowing sand to re-establish the island form and allowing sand to build up the dune process.

The Navarre Pass would not stay open unless a large jetty system were engineered and constructed on the east and west sides. Natural passes occur along the northwest Florida coast in conjunction with large drainage basins. The Narrows as the portion of the Santa Rosa Sound is known, is shallow and likely was a large wetland before being dredged for the intercoastal waterway. Pensacola Pass is known as one of the few deep water passes in the region because it empties all the rivers the PBS SWIM Plan addresses.

This idea of opening the pass is driven by the economic concept of growing the Holly – Navarre area along Hwy 98. As we have mentioned earlier, the area is already suffering from the inability to treat effluent within its WWTP facilities. This low lying flood prone region is limited on well drained real estate. Engineering a highly reinforced jetty to allow boats to access the

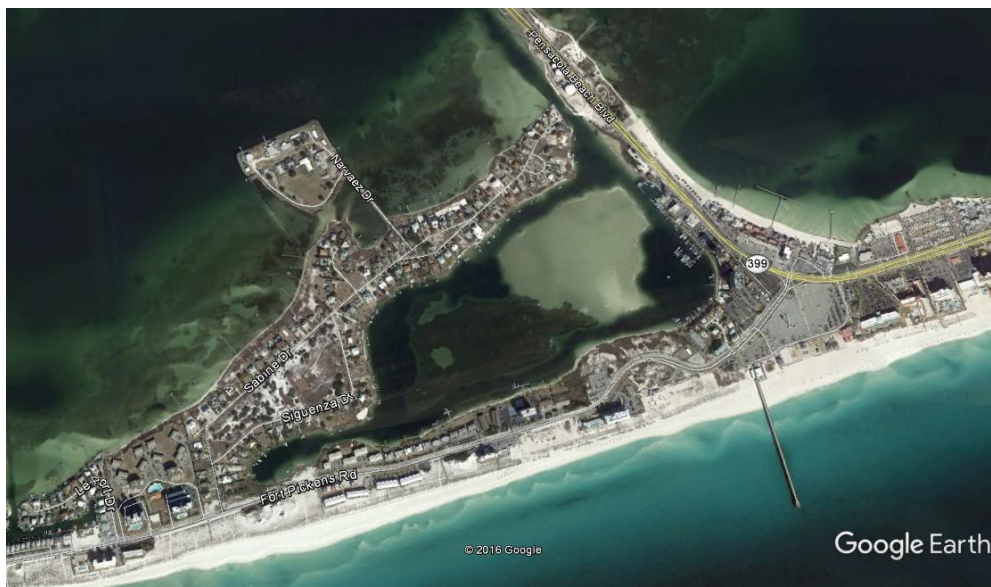
Gulf instead of using the Destin or Pensacola Pass is money thrown away. Continual dredging will be required to sustain the beaches to the west, not to mention the ecosystem shift that the estuarine system will undergo. We have also heard that opening the pass would improve water quality through flushing. We question why the concept of the solution to pollution is dilution is still being considered in this day and age?

In 2008, Eglin Air Force Base testified in front of the previous Santa Rosa County Commissioners how opening the Navarre Pass would interfere with their mission. We agreed with Eglin then and still are opposed to opening the Navarre Pass in the future.

Public education and awareness are big components of the SWIM Plan. We recommend the development of a short course focused on the local ecosystem in Northwest Florida followed by a quiz. The target audience would be the lay public and all elected officials. Specific to elected officials, in order to remain in office, it is mandatory to achieve 90% correct answers.

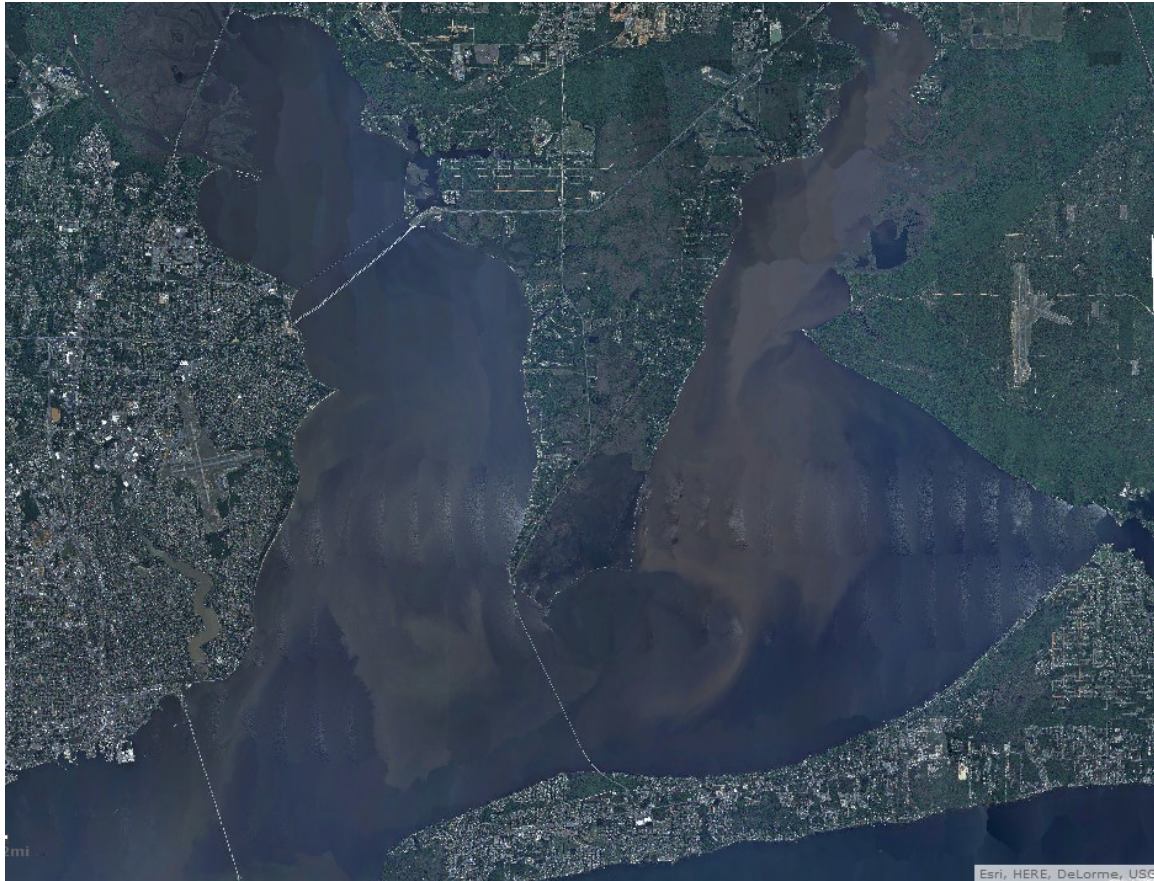
Stormwater Runoff on Pensacola Beach

Stormwater is a concern in the core area on Pensacola Beach, specifically where marinas, restaurants and hotels are co-located. Little Sabine Bay is a small bay surrounded by this type development, near the core. This shallow bay has a large intermittent sandbar which has hosted nesting shorebirds in the past. This area exhibits low tidal ranges and variable flushing times. Activities in this area resulted in high E.coli measurements, which resulted in funding to install a pump in the lower southwestern arm of the bay. During peak summer months, when boating and water born sports are on the rise, pumps can be activated to exchange water in the system. Ironically, the discharge from Little Sabine enters the Santa Rosa Sound adjacent to the causeway leading to the US EPA Research Island (east side). We interpret this as dilution of unhealthy and impaired waters, and do not see the wisdom of pumping into an area with known healthy and lush seagrass beds. We question how this type of project can be funded and implemented given the potential impacts in these seagrass meadows.



Aerial view of Little Sabine Bay in the core district of Pensacola Beach. The small island in the upper left corner is the USEPA, with seagrass beds located on both the east and west sides of the island.

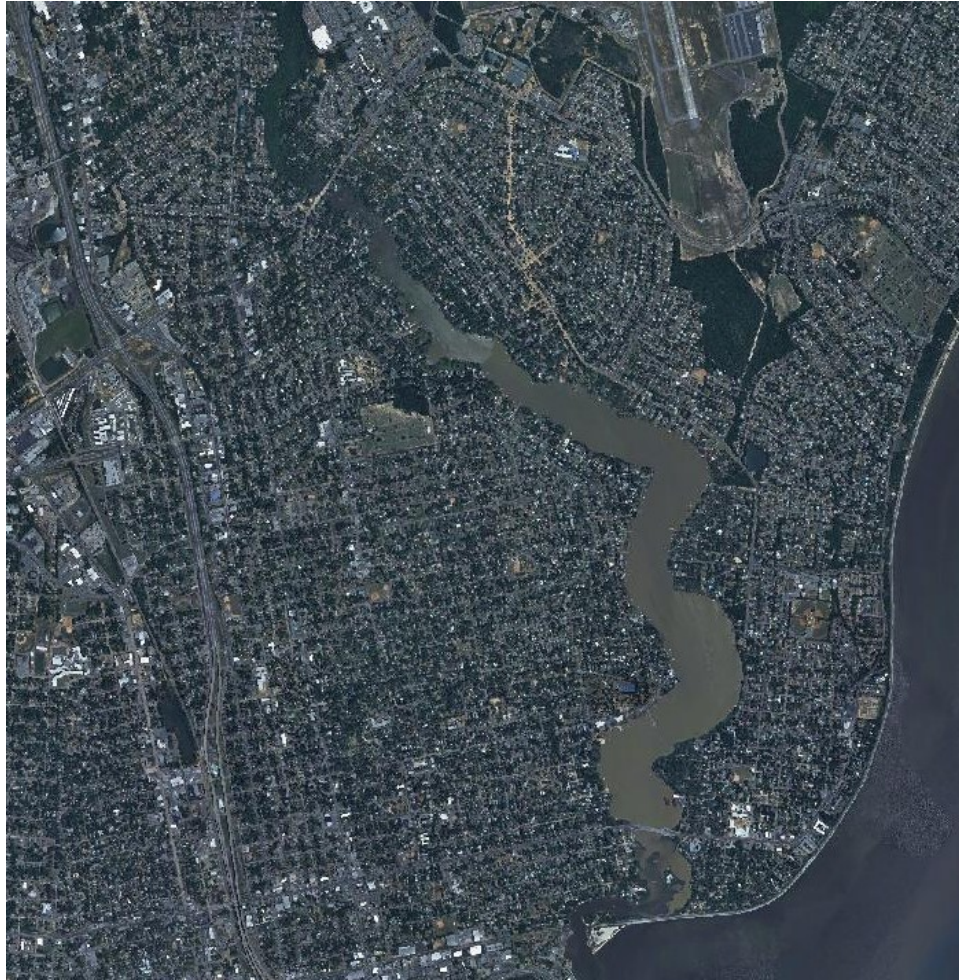
Stormwater and Turbidity in the Upper Watersheds



Aerial view of the Pensacola Bay System following the April 2014 28" flood event. Finer sediments stayed in suspension for weeks due to wind driven currents and tides.

Stormwater is rain or surface water that cannot be absorbed into the ground because the ground is either saturated or impervious. When areas experience heavy rainfall over a short period of time, the ground water aquifer fills up (as a reservoir) and doesn't allow more water to soak in or percolate down into the ground. When this happens, the rain water collects at the ground surface – forming sheets of water that flow downhill, toward the lowest point of land, or usually into a wetland, creek, river, bay, or other coastal water body (surface waters). This sheet flow of water is referred to as stormwater runoff.

Sediment can cloud the water (turbidity) and make it difficult or impossible for aquatic plants to grow by shading out sunlight. Sediments also can destroy aquatic habitats by smothering. Chemicals can also absorb themselves onto tiny sediment particles, which can stay in suspension for days, weeks, or months due to currents or strong winds. Some chemicals can remain so tightly attached to sediments that they can become buried when conditions are calm, only to become re-suspended when conditions change in a violent manner (eg., tropical event such as hurricanes) and re-contaminate the system. This term is coined tertiary pollution effects and can be a ticking time bomb for area waters.



Aerial view of Carpenter Creek following the April 2014 28" flood event. Finer sediments stayed in suspension within the bayou for over five weeks due to wind driven currents and tides.

When sediments get picked up by stormwater and carried into larger waterbodies, they will remain in suspension until water flow and velocity slow. At this point, they will eventually settle out. Flood plains and riparian zones – when intact would be the prime location for this activity. Loss of flood plains and riparian zones results in sediments making their way into the main waterbody. When conditions quiet enough to allow settlement, suspended material drops out of the water column and blanket the bottom. This settlement of fine particulates over decades has caused the bayou and bay bottoms to smother. Worse, these sediments are often bound with chemical compounds, which have been proven to remove oxygen from the water column. This condition exists in each of the urban bayous and the larger bay basins.

Turbidity from sediments or shading due to phytoplankton blooms have both been shown to shade the seagrass habitat. Increasing the buffer zones along shorelines, creeks and wetland systems will begin the process of slowing this injury to the system.



Julian Mill Gully located south of I-10 and adjacent to the boundary of Santa Rosa and Okaloosa Counties. This gully continues to grow with each rain event as water off the interstate continues to erode this system. The sediment is flowing along what was once a tributary, but is buried today. The lower portion of the sediment fan has entered the wetland and will soon be suspended in the surface water creek. This site has been discussed and reviewed for 25 years. Stabilization utilizing native plants and on site materials have been discussed, but no action has been taken. This site, as with the Indian bayou site, are a result of not understanding the watershed system and function when the I-10 corridor was developed in 1970. Julian Mill Creek flows into the Yellow River and discharges into upper East Bay, in the Yellow River Management Area.

Urban Bayou's

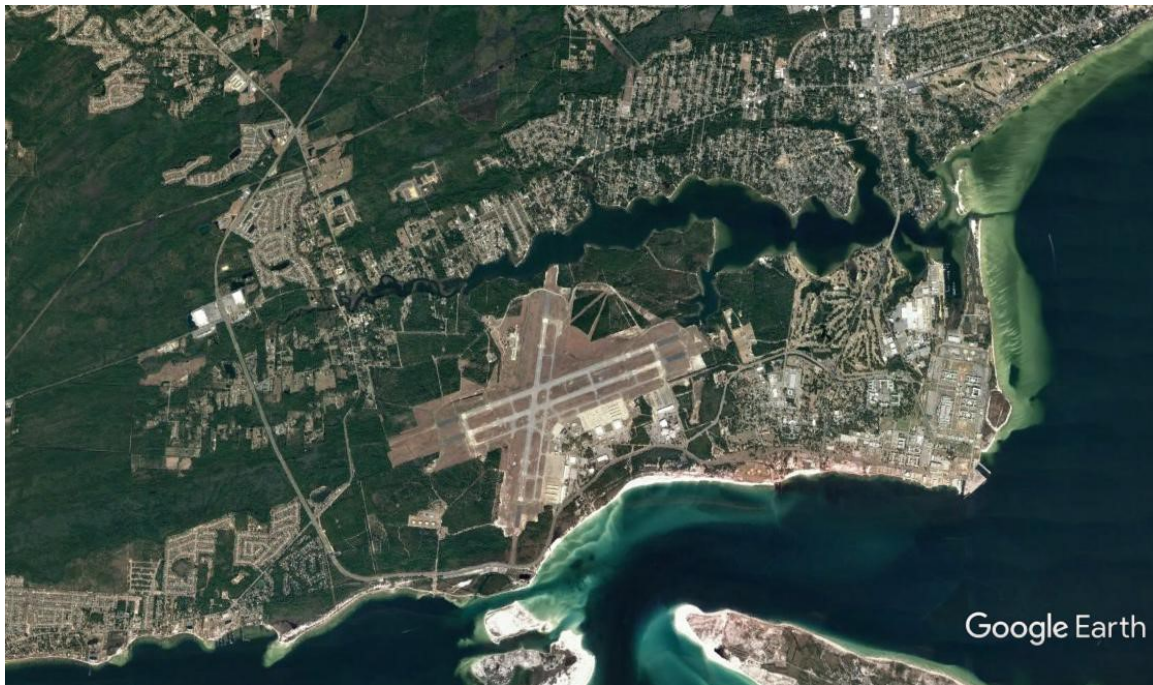
The PBS includes three large urban bayous: Bayou Grande, Bayou Chico and Bayou Texar. Each is impaired from multiple impacts (including stormwater runoff, nutrients, E. coli, and industrial discharge) has been the subject of numerous studies over the decades by universities, consultants, the state and other governmental agencies.

Impairment of these systems has been rapid, within the last 5-7 decades, and reversing the condition is possible but will require a good understanding of the hydrology, biology, and reconnection of the fragmented system. All three bayous occur in Escambia County and unfortunately are fragmented multiple times each through roads and culverts.

Research pertaining to coastal systems and stream hydrology has identified maintaining the riparian zones and flood plains to mitigate runoff, sequester nutrients and capture sediments before they enter the main channel of the creek or the ending basin, in this case the bayou. The fragmentation of these watersheds by culverts and bridges that do not span the flood plain can cause catastrophic impacts as was observed in the April 2014 flood in which 28" of rain fell in areas of the county during a 24 hour period. This fragmentation and allowing development in the riparian zones contributes to the impairment of the system.

Unfortunately the decision makers do not receive this information or it is not properly explained in an economic manner to warrant their interest. As a result, one need not look too hard to find problems with continued development in these sensitive areas.

We highly recommend all bridges that span creeks be designed to have their bridge approach include the flood plain. Culverts should be replaced by bridges which are designed to allow natural bottoms for connectivity of sediments, hydrology and habitat (woody material) and wildlife to use as a corridor, regardless of being labeled cost prohibitive. Native plants should be encouraged in lieu of any form of hardening since the roots of these adapted species are known to form the foundation of the local terrain. Natural systems are also capable of self healing.

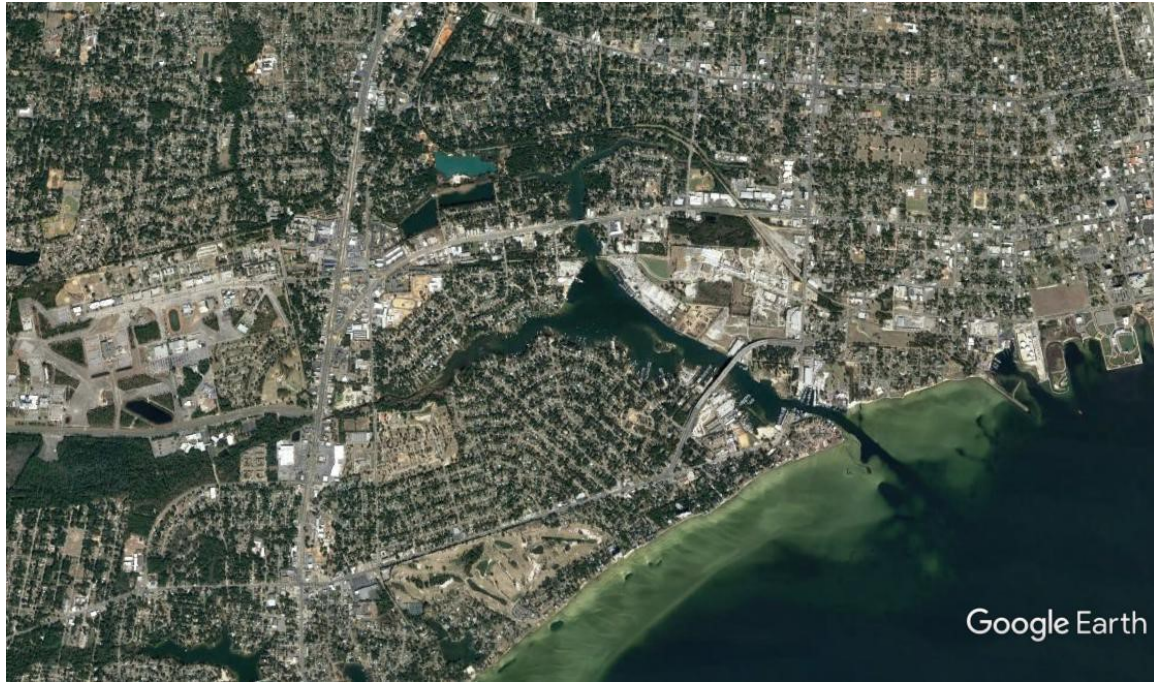


Bayou Grande in southern Escambia County

Bayou Grande is the largest bayou of the three and is situated on the west side of southern Escambia County. Bordered by Pensacola Naval Air Station to the south and Beach Haven and Navy Point to the north, this bayou is surrounded by old and dense housing development which surprisingly in this day and age is still on septic systems. Residents who have lived on the bayou for many decades remember a time when the bayou was surrounded by emergent grasses, shrimping and crabbing fed families, and during migrations the bayou was filled to the brim with ducks. Today the system is attempting to recover, as multiple patches of seagrass and oysters were observed in 2016 as part of a seagrass study. Conversion of septic to sewer and revegetating the shoreline with a 50' buffer would certainly expedite the process.

Threats to this bayou include the development occurring on the western portion of this watershed in the vicinity of Sorrento Road and Blue Angel Parkway. The western portion of this bayou is fed by a tributary which is currently still in a natural state. The development of a Target, Walmart and gas stations on the northeast and northwest have created development centers in low lying areas and are encouraging growth in similar low lying areas. We recommend using

LiDAR as a tool to move development to higher ground. The low lying wetland areas that develop and feed the western tributary should be purchased and protected, as we know that development in low lying areas is risky and a threat to surface waters.



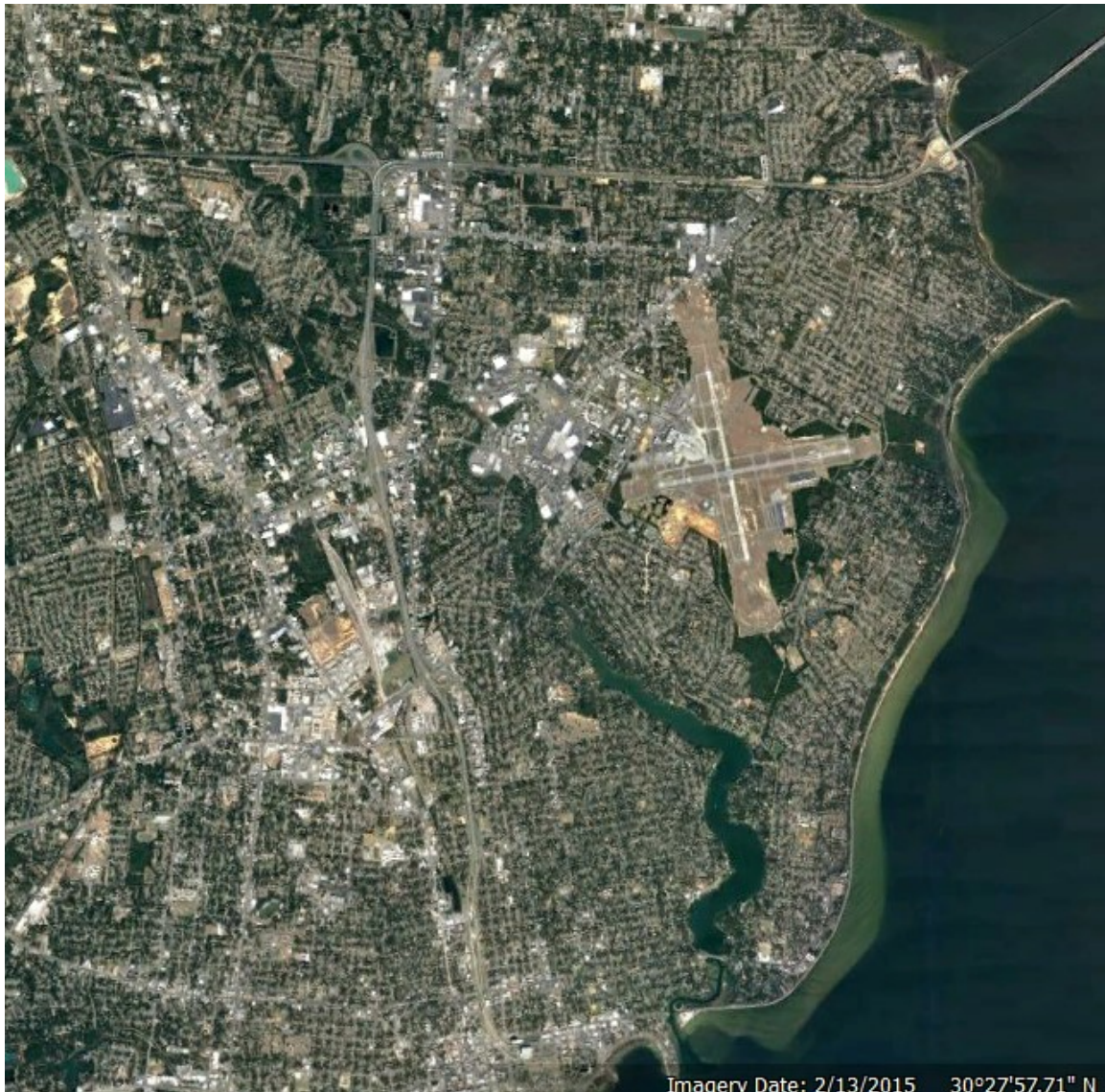
Bayou Chico is the most developed of the three urban bayous and is the most impaired as well.

Bayou Chico is the most industrial bayou of the three having several marinas, boat yards, and metal scrap yards. Several large chemical plants including Reichhold Chemical which supplies a range of coating and performance resins for use in architectural, industrial, powder and graphic arts applications are located adjacent to the bayou.

Due to its central location between the Port of Pensacola and the Navy Base, this bayou was the hub of commerce in the 19th and early 20th century. The sediments in this system are contaminated with heavy metals, and PCBs, PAHs, and other known carcinogens. Organic loads due in part from the early timber industry continue to reduce oxygen in the water column and especially on the bottom of this system. As a result of this activity, this system is highly polluted and in 1970 was designated the first Basin Management Action Plan, BMAP, in the state of Florida. This special designation resulted in focusing funding on identifying and addressing the issues, one by one. First item looked at fecal coliform loads and recognized that several of the older neighborhoods within the watershed were on septic and were leaking into the waterbody. Sedimentation continues to plague all the watersheds in this system, but due to the historic activities associated with this bayou many of the contaminants are located in the settled sediments which can be easily re-suspended during storms, through run off and wind action.

Threats include continued runoff and continued development in low lying areas. This watershed is virtually built out as can be seen in the aerial picture below. The cost for addressing water quality within this bayou have cost the taxpayers of Florida over \$75M to date, with another

\$15M dedicated and earmarked for sediment removal. The BMAP approach to addressing this system is expensive and has yet to be determined if this is a feasible approach to addressing these impairments. New technologies are being considered in the hopes of repairing this system. Three tributaries feed into this system, the two northernmost (Jackson and Maggie's Ditch) are at the receiving end of greater topographic relief, whereas Jones Creek is in part still connected to the flood plain and has a slower flow rate.



Bayou Texar is mostly surrounded by large homes, it's main feeder tributary is Carpenter Creek which was considered rural at its three headwaters in the 1960s. The system became impaired through sedimentation in the mid 1960s with the development of Sacred Heart Hospital – which was located on high ground adjacent to steephead ravines and seepage slopes. This location for the hospital, followed by Cordova Mall served to shift the landscape to suburban by the 1980s into urban by the turn of the century.

The system is hydrologically connected to several contaminated Superfund sites which discharge into the upper bayou just south of 12th Avenue. Many lawsuits over the years have resulted in sizeable fines; unfortunately these monies are never applied to the problem or used to mitigate the impacts. Instead they are divided between homeowners with the lion's share going to the law firm that picked up the case.

By 1970, fish kills in Bayou Texar were a regular occurrence. Mostly made up of menhaden and mullet, the entire area would be awash in floating bloated dead stinking fish. That would be about the same time that the brown pelican left the area – for decades. Birds are a good indicator of the health of a system. This went on for the next two decades.

The Pensacola News Journal published the following headline in the 8 August 1990 edition; *Pensacola has answer to smelly fish kills: Nets*. City of Pensacola spokesman Carlton Proctor reports that city officials think they have found a way to prevent fish kills: catch the fish before they die. The article goes on to state: almost every summer, thousands of tiny menhaden gather and then die off in the oxygen depleted waters of Bayou Texar, creating stink and costing the city thousands of dollars to clean up. The remedy; the city and state are allowing net fishing, normally outlawed in the bayou, on a limited basis for the second year in a row.

In April 2010 the BP Macondo Oil Well in the Gulf of Mexico exploded and flowed oil under pressure for the next 90 days. Millions of dollars were applied to attempt to shut off and mitigate the millions of gallons of oil before the oil could affect sensitive ecosystems. Since the state of Florida does not allow oil drilling in the Gulf, our state was unprepared in how to respond.

Fast forward, counties in Florida which experienced oil on their beaches (eight in total all in the panhandle) will receive funding from the penalty portion of the Clean Water Act fines. A long drawn out process which continues to be adjusted and tweaked today, was developed to provide the community within the county the means to 'transform ourselves as a community'.

Many citizens across the Gulf participated in the process to develop criteria and present ideas to improve their area. One of these ideas was to restore Carpenter Creek and Bayou Texar in a holistic fashion from the headwaters to the mouth of Pensacola Bay. This goal is similar to the BMAP approach being applied to Bayou Chico, but in the Carpenter Creek and Bayou Texar Economic and Environmental Revitalization Plan, the county will work with the community, who will be invited to participate in restoring this watershed, just as they were invited to review the proposal. The approach vests the community, utilizes fifty years worth of water quality data which reflects the changes over time and invites the public to be a part of the process.

The 10-year plan includes restoring the riparian zones and flood plains which have been fragmented by multiple roads and interstates; replanting native species to stabilize the creek and create a healthy habitat for wildlife which also use the area; reconnect the hydrology of this system; create an educational component in the commercial portion to reconnect the public with our watersheds. Unlike the BMAP, citizen groups who have been active in this watershed will have a role in how this approach can be accomplished. Local academic institutions, businesses, governmental agencies, NGOs and citizens within the community have been included in the proposal from the start to avoid this project being awarded to a contractor that

is inexperienced in the coastal plain. Utilizing this approach for this project will truly transform this community.

Recommendations

We recommend a fund be established and set aside to ‘keep the dialogue going’ and support nature based citizen groups working within the community. Many citizen groups including the Bream Fishermen (BFA) have been sampling water quality in creeks, branches and rives within this watershed for over 50 years. This data is used by many state and federal agencies to develop site specific criteria. We believe this level of commitment should be funded, regularly, since there are many costs involved in this practice.

We recommend a central location be developed for collection of reports, studies and important published and white papers for public access, since this area is rich in data and publications. A 1985 bibliography developed by the BFA was updated in 2009 by the UWF – Center for Environmental Diagnostics and Bioremedaition. In 2015, Escambia County developed an on line tool called the Best Available Science Tool (BAST) which links the two efforts but is difficult to access, especially for citizens who do not have internet access. Both have data gaps. Dedicated funding would remedy this and could be used to develop a platform for multi-media to provide information to the public and connect the public to their resources.

An observation worth noting is the loss of continuity when staff turnover occurs in various departments and agencies. Citizen groups often fill in the gaps. These relationships and institutional knowledge of these collective organizations within the NW FL Region are long lasting and should be valued as a resource.

The downside of increased turnover of staff within various departments and agencies is the phenomenon known as ‘Shifting Baselines’. That is the practice and perception when someone new to the area, unfamiliar with the flora, fauna and landscape – interprets impaired ecological areas as pristine. This is a common occurrence and lends more support to education and outreach.

We expect the agencies charged in oversight and protecting the resources also value the resources they are managing, and to lead by example even when out of the line of sight.

We have observed state, county and city staff select expensive, out of town contractors to address local issues often finding they have little to no experience within the landscape.

We have observed that throwing money at problems after the fact is always expensive and rarely accomplishes the task. Not to mention this process wastes what scarce funding exists.

Smart Growth should be the norm in today’s urban, suburban or rural regions such to include the values of the rural community. Impervious highly engineered development should not be permitted in low lying flood prone areas due to our highly erodible sandy soils and our 65” of rain annually. A more sustainable approach would be to retreat from low lying areas and place them into conservation easements.

While growth appears to be the focus in our rural areas, it remains obvious that our current and future tax base cannot support the cost of cleaning up and restoring these impaired systems. Self-policing whether by industry, municipality, by state, county or city has not improved the water quality in this watershed; in many cases self-policing may compound the problems. The tax base should never depend upon to support the cost of cleaning up and restoring these impaired systems, smart planning at a watershed level could help address these problems before they become impaired. Individual jurisdictional areas will then be expected to follow thru with oversight and implementation.

Population increases will require additional treatment for wastewater facilities to address the many micro pollutants, microplastics and endocrine disruptors which are being detected in surface waters. These compounds including micro pollutants are being detected by more powerful analytical methods related to the steady rise in the use of man-made substances. The compounds in question include pesticides, pharmaceuticals, biocides, ingredients in personal care products, waterproofing agents, detergents, paints, etc., which find their way into natural waters from a variety of sources – agriculture, households, construction and transportation.

We support consolidation of all outdated area WWTPs into a state of the art facility capable of removing endocrine disruptors, pharmaceuticals, pesticides and herbicides – especially in the built up peninsula of Gulf Breeze. We recommend a moratorium on building in any more areas of low elevation, recognizing the cost to everyone including the environment for allowing development in areas with a high water table. We would like to see utilization from groups like the Water Environment Federation, and their research arm to address many water quality issues in our area. <http://www.werf.org/>

We recommend maintenance, upkeep, monitoring and repairs be included in all environmental projects. We recommend independent oversight by citizen groups to ensure best management practices are observed and applied, invasive species are not introduced by un-aware contractors, and agencies work with citizens to address problems – instead of providing ‘run around’ or ‘passing the buck’ (Indian Bayou).

We support and value work in the area of estuarine research to protect the remaining sea grasses our region still harbors, including the Estuarine Research Federation <http://www.erf.org/>, Florida Fish and Wildlife Conservation Commission, <http://myfwc.com/research/habitat/seagrasses/>, and UWF Center for Environmental Diagnostics and Bioremediation. <http://uwf.edu/cse/departments/cedb/research/research-projects/>

Other resources include the local USEPA research facility, the **Gulf Ecology Division (GED)** conducts innovative research and modeling to assess and forecast future risk to ecological integrity from pollutants and other stressors, to develop tools and criteria for supporting resilient watersheds and water resources, to predict the adverse outcomes of chemicals at molecular through population scales, and to link environmental condition to the health and wellbeing of people and society. <https://www.epa.gov/aboutepa/about-gulf-ecology-division-ged-epas-national-health-and-environmental-effects-research>

Another excellent resource which should be utilized is the Society of Environmental Toxicology and Chemistry. www.SETAC.org

We are very concerned that the conditions in bayous described in the text (Ferry Pass in Escambia and Indian Bayou in Santa Rosa County) will continue to degrade for years until these systems reach the state of Bayous Chico or Texar, before interest and money can improve them.

We ask to be included in future dialogue and be considered when opportunities arise in our area to be included with funding. Our organizations have remained active and maintain websites, so we are easy to find.

We agree with this statement:

To restore waterbodies with impaired water quality, protect public health, preserve valuable habitat, natural resources, and ecosystem services, and ensure long-term sustainability and resilience, it is critical to identify sources of point and NPS pollution, causes of degradation, and the current status and health of natural systems and floodplains within the watershed. A comprehensive understanding of watershed conditions and resource issues will inform and facilitate management actions, including planning and permitting.

And would like to add, oversight and help through support by local citizen science groups could save money and expedite restoration efforts.

We believe that water reuse without upgrades will lead to:

Degradation of water and/or sediment by toxic chemicals can impact surface water quality and the health of associated upland and aquatic habitats and generate contaminated food chains. Chemical contaminants can also be harmful to humans, particularly through consumption of seafood containing elevated quantities of mercury, polychlorinated biphenyls, dioxin and other harmful chemicals. Public health agencies monitor concentration levels of undesirable chemicals that occur in public natural resource land and recreational waters (EPA 2015b, 2015c).

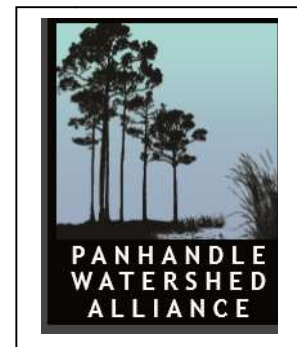
And would like to add, with population and visitors on the rise to northwest Florida, we believe that not upgrading these systems puts the public directly in harm's way. In addition, recreational areas should have signage prominently displayed when activities in the water are risky or eating fish caught in the area is in question. Not doing so, when the information is in hand seems to open the county and state to liability and illness. Not to mention bad PR for tourism and our local economy.

Our Membership are interested in our resources and understand the connection between the migrating birds, the native plants which are awakened after prescribed fire from forgotten seed banks, our nurseries both on barrier islands or estuaries and the connection and complexity of these natural resources. Our members recreate, explore and protect our region.

We thank you for your time and hope you understand our positions and the connection between our organizations.

Healthy uplands = Healthy waters;
Healthy waters = Healthy communities; and
Healthy communities = Healthy economy.

These collective comments are offered from several non-profits who represent the public and value this community; these organizations value of the native flora and fauna, the seasonal migrations and landscape changes, the year round residents and the special way of life within these communities; Mostly these organizations expand the understanding and allow us to educate our communities through Citizen Science Programs.



WATER QUALITY MONITORING · HABITAT CONSERVATION · CITIZEN ENGAGEMENT · ENVIRONMENTAL EDUCATION